

REMARKS

Claims 1-11 are currently pending in the present application. Reexamination and reconsideration of the claims are respectfully requested in view of the Applicants' remarks below.

The present invention is directed to a processing apparatus that includes a baffle plate for partitioning between a process chamber and an exhaust passage through which gas may be discharged from the process chamber. In accordance with the claimed invention, the baffle plate includes a plurality of slits having tapered surfaces that open toward the process chamber. More specifically, the taper surfaces are formed to be not less than 1/4 of the depth of the slit, and are formed at an angle with the vertical axis of the slit openings such, wherein the angle is between five to thirty degrees (as recited in Claim 1). In an alternative embodiment, the plurality of slits have openings of different sizes on the two sides of the baffle plate such that the diameter of the opening towards the exhaust passage is larger than the diameter of the opening towards the process chamber (as recited in Claim 5 and shown in Figure 10C of the present application).

One of the objects of the present invention is to prolonged the operation time of the process chamber by reducing the speed in which the slits of the baffle plates are narrowed. More specifically, as shown in Figure 6 of the present application, conventional baffle-plate slit openings become narrow over time due to residue built up caused by the flow of plasma gas being exhausted. This built up condition requires regular cleaning or replacement of the baffle plate in order to maintain a constant pressure atmosphere within the process chamber. The preferred embodiment of the present invention, by providing the slits with a tapered surface of a specified length at a specified angle (as recited in Claim 1), substantially reduces the need for changing or replacing the baffle plate while maintaining a predetermined pressure within the process chamber. More specifically, when the tapered surfaces are formed as described above, reaction products or the like are successively deposited from the tapered surface onto the babble plate, substantially delaying the time during which the slit openings are narrows (as shown in

Figure 5 of the present application). As a result, the entire magnetron-type plasma process can be made more efficient (as shown in Figures 7-9 of the present application.

The Examiner rejected Claims 1-11 under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over Cho et al. (U.S. Patent No. 5,441,568). This rejection is respectfully traversed.

Cho discloses an exhaust baffle plate whereby the apertures are placed across the baffle plate so as to purportedly increase the effective range of the plenum situated below the baffle plate. Unlike the object of the present invention, the stated objective of Cho is to facilitate a more uniform gas flow across the substrate surface during the exhaust of the processing gas. Cho does not suggest any motivation for reducing the narrowing of the apertures caused by residue deposits. More specifically, Cho does not teach nor suggest forming a plurality of slits on the baffle plate in a tapered fashion such that the tapered surfaces are longer than 1/4 of the depth of the slit depth (as recited in Claims 1 and 5). Furthermore, Cho does not disclose nor suggest forming a tapered surface such that the surface forms an angle with an axis perpendicular to the slit opening such that the angle is between five and 30 degrees (as recited in Claim 1) or forming a slit such that the slit opening facing the process chamber has a larger width than the opening facing the exhaust passage (as claimed in Claim 5).

Rather, Cho merely suggests that the apertures on the baffle plate may be oriented at an acute angle relative the baffle surface so as to affect the direction of the vacuum pressure. More specifically, Cho suggests that such apertures may be formed by "boring a hole through the surface of the baffle on a drill press on which the workpiece has been inclined." Such slant surfaces do not cause the reaction products to successively deposit from the tapered surface onto the baffle plate as in the present invention. Rather, such slant apertures suffers the same disadvantages of residue deposit of the prior art discussed in the present application. Finally, the flared-out apertures 81a and 82a of Cho merely disclose aperture that open wider in a horizontal

direction. Accordingly, Applicants respectfully submit that Claims 1-11 are not anticipated by, nor made obvious in view of, Cho.

The Examiner rejected Claims 1-11 under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over Su (U.S. Patent No. 5,589,002). This rejection is respectfully traversed.

Su discloses a gas distribution plate whereby the slit openings of the plate that extend radially outward from the center of the plate. The slit openings are of particular dimensions and are separated from each other in acute angles on the horizontal surface. Figure 7 of Su shows that the slits may be formed at slanted angles extending away from the center of the plate. Su does not disclose nor suggest any inventive features of the present invention. More specifically, Su does not disclose nor suggest a baffle plate having slits with tapered surfaces such that the surfaces form an acute angle with an axis perpendicular to the slit opening (as recited in Claim 1), or slits such that the slit openings facing the process chamber have larger widths than the openings facing the exhaust passage (as claimed in Claim 5). Similar to Cho, Su's disclosure of slanted apertures do not provide the advantages offered by the present invention, and do not anticipate nor make obvious Claims 1-11 of the present application.

In view of the foregoing, Applicants respectfully submit that all of the claims in the present invention are in condition for allowance. Reexamination and reconsideration of the claims are respectfully requested and an early allowance is solicited. If the Examiner feels that it would advance the prosecution of the application, it is respectfully requested that he telephone the undersigned attorney of record as (213) 892-5587.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for

any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. **28503.20058.00**. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: July 10, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The paragraph beginning on Page 2, line 24, was amended in the following manner:

The baffle plate has the function of holding the reaction product made by the process, thus reducing the amount in which the [reduction] reaction product flows into the exhaust passage. The reaction product deposits on that surface of the baffle plate which is exposed to the process chamber (i.e., the surface of the plate facing the chamber). The amount of deposition is proportional to the time of process. If the product deposits on the rims of the slits [though] through which the gas flows from the process chamber, the slits will become narrower. Consequently, the pressure in the process chamber will rise. This impairs the uniformity of etching in the plane of the object (i.e., in-plane uniformity) or decrease the etching rate. To prevent such undesirable events, the maintenance of the baffle plate is effected at regular intervals, by either washing the plate or by replacing it with a new one. If the process generates deposit in large quantities, however, the maintenance must be carried out more frequently. In this case, the throughput of the process will decrease.